



UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

PD

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/659,490	09/11/00	BREBOL	K 459-482F

002292 MMC1/0518
BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH VA 22040-0747

EXAMINER

CUEVAS, P

ART UNIT	PAPER NUMBER
----------	--------------

2834

DATE MAILED: 05/18/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

<p align="center">Office Action Summary</p>	<p>Application No.</p> <p>09/659,490</p>	<p>Applicant(s)</p> <p>BREBOL, KLAUS</p>	
	<p>Examiner</p> <p>Pedro J. Cuevas</p>	<p>Art Unit</p> <p>2834</p>	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) ____ is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 12-24 is/are rejected.
- 7) ☒ Claim(s) 10 and 11 is/are objected to.
- 8) ☐ Claims ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 September 2000 is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- | | |
|--|--|
| 15) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 18) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____ |
| 16) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 19) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 17) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ | 20) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a) because they fail to show reference numbers 69 and 66 as described in lines 24 and 25 of page 9 of the disclosure. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Correction is requested.

Applicant is required to submit a proposed drawing correction in reply to this Office action. However, formal correction of the noted defect can be deferred until the application is allowed by the examiner.

Claim Objections

2. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claims 3 (the second) and 4 been renumbered 4 and 5.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 12-14, 15-16, 17-21 and 23-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 12-14 recites the limitation "the ratio b/h ". There is insufficient antecedent basis for this limitation in the claims.

Claim 12 also recites the limitation "the height h ". There is insufficient antecedent basis for this limitation in the claim.

Claims 15-16 and 17-21 recite the limitations:

- "the ratio o/b "
- "the transverse dimension o "
- "the width b "

There is insufficient antecedent basis for this limitation in the claim.

5. Claim 23 recites the limitation "the electrodes of" in line 28 of page 16 of the disclosure. There is insufficient antecedent basis for this limitation in the claim.

Claim 24 recites the limitations:

- "the electrodes of"
- "the piezoelectric material"

- "the embedded electrode"

There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5 and 7-9 rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 3,562,563 to Schafft.

Schafft clearly teaches the construction of a piezoelectric transformer with a primary annular portion (11a) and a secondary annular portion (11b), capable of generating and transforming piezoelectric vibrations in accordance with an AC Voltage fed to one portion. These piezoelectric portions are annular in shape, polarized perpendicular to the peripheral direction and adapted to operate at a resonance frequency of a dimension of a cross-section of the annular body perpendicular to the peripheral direction as stated in the SUMMARY OF THE INVENTION.

With regards to claim 2, Schafft discloses a piezoelectric transformer where the annular body is an annular body as shown in Figures 1-3 and 5.

With regards to claim 3, Schafft discloses a piezoelectric transformer where the resonance frequency of a dimension of a cross-section (R) of the annular body perpendicular to the peripheral direction of the annular body is a resonance frequency of the thickness (A) of the annular body.

7. With regards to claim 4, Schafft discloses a piezoelectric transformer where the primary and the secondary portions of the piezoelectric body have been polarized in the thickness (A) direction of the piezoelectric body.

With regards to claim 5, Schafft discloses a piezoelectric transformer where the primary portion of the annular piezoelectric body has been radially polarized.

With regards to claim 7, Schafft discloses a piezoelectric transformer where the piezoelectric body is annular with a through-going opening as shown in Figures 1 and 3.

With regards to claim 8, Schafft discloses a piezoelectric transformer where the opening is a through-going opening in the thickness (A) direction of the body as shown in Figure 1.

With regards to claim 9, Schafft discloses a piezoelectric transformer where the annular piezoelectric body (11) is shaped as a hollow circular cylinder with a circular cylindrical opening having the same center as the cylindrical body as shown in Figure 3.

8. Claims 1, 6, and 22-24 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,861,704 to Kitami et al..

Kitami et al. clearly teaches the construction of a piezoelectric transformer with a primary portion (13) and a secondary portion (12) as shown in Figure 2, capable of generating and transforming piezoelectric vibrations in accordance with an AC Voltage fed to one portion. These piezoelectric portions are annular in shape, polarized perpendicular to the peripheral direction, adapted to operate at a resonance frequency of a dimension of a cross-section (R) of the annular body perpendicular to the peripheral direction and where the secondary portion is provided with a plurality of inner electrodes (6).

9. With regards to claim 22, Kitami et al. discloses a piezoelectric transformer, which contains a separate galvanic separation layer (37) between the primary and the secondary portions as shown in Figure 11.

With regards to claim 23, Kitami et al. discloses a piezoelectric transformer, where the electrodes of one or both portions of the piezoelectric body are embedded in their respective portion, and where the piezoelectric material (37) between the portions and the embedded electrodes, is used as a galvanic separation while still actively participating in the power transfer as shown in Figure 11.

With regards to claim 24, Kitami et al. discloses a piezoelectric transformer with:

Art Unit: 2834

- a piezoelectric body (Fig. 11)
- a primary portion (1) and a secondary portion, both being able to generate and transform piezoelectric vibrations
- electrodes (6) on one or both portions of the piezoelectric body, embedded in their respective portion
- a piezoelectric material (37) between the primary and the secondary portion to be used as a galvanic separator while still actively participating in the power transfer of the device, as shown in Figure 11.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 12-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,562,563 to Schafft in view of common knowledge in the art.

Schafft discloses the claimed invention except for a piezoelectric transformer where the ratio b/h between width b of the wall of the annular body and the height h of the wall of the

Art Unit: 2834

annular body (the thickness of the annular body) is at the most 0.25 for the purpose of maximizing the efficient coupling of the piezoelectric transformers.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to select the ratio b/h between width b of the wall of the annular body and the height h of the wall of the annular body (the thickness of the annular body) of a piezoelectric transformer to be at the most 0.25 for the purpose of maximizing the efficient coupling of the piezoelectric transformers, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

12. With regards to claim 13, Schafft discloses the claimed invention except for a piezoelectric transformer, where the ratio b/h is between 0.35 and 0.8.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to select the ratio b/h is between 0.35 and 0.8, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

With regards to claim 14, Schafft discloses the claimed invention except for a piezoelectric transformer, where the ratio b/h is between 0.4 and 0.7.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to select the ratio b/h to be between 0.4 and 0.7, since it has been held that

Art Unit: 2834

where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

13. With regards to claim 15, Schafft discloses the claimed invention except for a piezoelectric transformer, where the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the 30 wall part of the body surrounding the opening is at least 0.5.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to select the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening to be at least 0.5, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With regards to claim 16, Schafft discloses the claimed invention except for a piezoelectric transformer where the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening is at least 1.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to select the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening to be at least 1, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Art Unit: 2834

14. With regards to claim 17, Schafft discloses the claimed invention except for a piezoelectric transformer, where the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening is at least 1.5.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to select the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening to be at least 1.5, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

15. With regards to claim 18, Schafft discloses the claimed invention except for a piezoelectric transformer, where the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening is at least 2.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to select the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening to be at least 2, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Art Unit: 2834

With regards to claim 19, Schafft discloses the claimed invention except for a piezoelectric transformer, where the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening is at least 3.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to select the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening to be at least 3, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

16. With regards to claim 20, Schafft discloses the claimed invention except for a piezoelectric transformer, where the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening is at least 5.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to select the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening to be at least 5, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With regards to claim 21, Schafft discloses the claimed invention except for a piezoelectric transformer, where the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening is in the interval of 1-5.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to select the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening to be in the interval of 1-5, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Allowable Subject Matter

17. Claims 10 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Since allowable subject matter has been indicated, applicant is encouraged to submit formal drawings in response to this Office Action. The early submission of formal drawings will permit the Office to review the drawings for acceptability and to resolve any informalities remaining therein before the application is passed to issue. This will avoid possible delays in the issue process.

Art Unit: 2834

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- US006025670A Corl et al. Feb. 15, 2000
- US005939818A Hakamata Aug. 17, 1999
- US005081391A Owen Jan. 14, 1992

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pedro J. Cuevas whose telephone number is (703) 308-4904. The examiner can normally be reached on M-T from 8:00 - 5:30; F from 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Néstor R. Ramírez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-1341 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

pjc
May 16, 2001


NESTOR RAMIREZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800